DAIRY DEVELOPMENT FOR KENYA

USAID Agreement 623-A-00-01-00102-00

FINAL REPORT

August 31, 2001 - February 28, 2003

In support of
SO 7: Increased Rural Household Incomes

Submitted to:
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Dates of project:	August 31, 2001 – February 28, 2003
Total Federal Funding:	$199,534.00
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I. Executive Summary

The Dairy Development for Kenya (DDK) project set the stage for creating a strong foundation for development of the Kenyan dairy sector. The project objective aimed to develop a sound analysis of the sector – with a particular focus on the informal market – and conduct field activities targeted at the singular goal of assisting to "build a strong private, commercially oriented dairy sector." The summary goal and intended results are detailed in the work plan approved by USAID (Appendix B).

The project objective was to increase production, processing and distribution such that producers and distributors increase their incomes and deliver lower-cost, better-quality dairy products. Specifically, this project was committed to the following goals:

1. Building a strong private, commercially oriented dairy sector;

2. Bringing better-quality, less-expensive dairy products to the market;

3. Improving the health of Kenya's population through increased consumption of dairy products.

During the project period direct training was delivered to 663 farmers, milk traders and dairy stakeholders. Ten co-operative societies representing 25,340 members were also trained, and it is envisaged that information disseminated will reach the quoted membership members. In the same period, three (3) new business linkages were established, covering improved genetic products, bulking and cooling, as well as milk processing.

II. Project Support of Strategic Objective

SO7: Increased Rural Household Incomes

Impacts on USAID Intermediate Results

The project contributed towards three of USAID's Intermediate Results (IRs), namely:
IR 7.1 - Increased productivity;
IR 7.2 - Increased agriculture trade; and
IR 7.4 - Increased effectiveness of smallholder organizations to provide business services to their members and represent their business interests.

- The activities that contributed towards IR 7.1 include on-farm technical consultancies, farmer education tours, farmer field days and the training of trainers.
- Activities that contributed towards IR 7.2 include the small-scale processing and milk handling courses, new business linkages and the international processing consultancy.
- Activities that contributed towards IR 7.4 include management training and the business linkages.

Objective	**Performance indicators**	**Project Impacts**
Private, commercially oriented dairy sector strengthened	5% increase in milk marketed by the targeted cooperatives	Milk turnover for Kaptumo cooperative increased from $187 to $202, i.e., by more than 8% within a period of four months *(see Figure 1 below)*.
	20% of targeted processors report reduction in processing costs	No data was collected to quantify this indicator. It will be quantified under the new project.
	DISAK registered by end of project period	Not achieved, as government approval to register DISAK had not been received by end of project.
	25% of targeted hawkers practice minimum standards developed	The huge value of people-level impacts reported in connection with M&E on milk handling training and management training (Table 1) was largely attributed to huge savings from reduced milk losses after training.
	Implementation of action plans initiated by end of project	8 cooperatives, namely: 1) Island, 2) Ngukurani, 3) Gatutururi, 4) Kaptumo, 5) Naro Moru, 6) Jaribu, 7) Lessos, and 8) Kariita; completed and implemented their action plans according to agreed-upon work plan activities.
	50% of the coops implementing improved management and feed conservation practices	The huge value of people level impacts reported in connection with farmer field days was due to adoption of feed conservation technologies which were the main subjects of training during the field days.

Investment Returns on Project Funding

The KDD project generated an Internal Rate of Return (IRR) of 39 percent, calculated as follows:

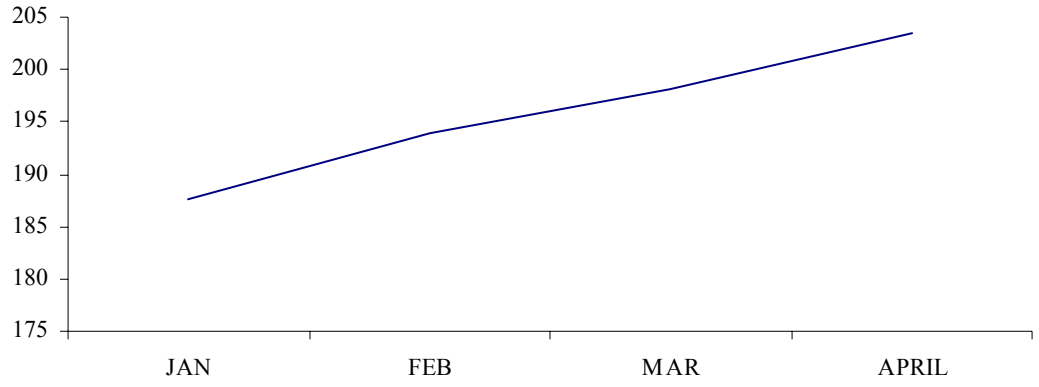
$$\text{IRR} = \frac{\text{Income generated}}{\text{Project funding}} \times 100$$

Income generated (projected people-level impact) = USD 77,968

Project funding = USD 199,534

Therefore, IRR = 39%

Figure 1: Kaptumo Co-op monthly milk turn-over in year 2002 (US$)



III. Detailed Project Performance Schedule

A summary of the completed activities with the respective projected people-level impacts and the corresponding match costs are shown in Table 1. It is estimated that the project generated a people-level impact valued at USD 77,968.

Table 1

Activity	Topic/objective covered	No. of events	Total Attendance (farmers, etc.)	Remarks/other assumptions	Match costs from activities	Projected people level impacts
Small-scale processing and milk handling courses	Small-scale processing of fermented milk products Hygienic milk handling Legal requirements for operating milk business How to succeed in business	1	43	Training venue: Nyeri	Match cost: Kshs. 27,000	
Informal milk market training	Development of code of standards for milk hygiene Development of appropriate metal milk transportation containers for informal milk traders	1	24	Training venue: Muranga Collaborators - ILRI	Match cost: 4,800	
New business linkages	Arrangements for new dairy-related business linkages:- ABS/Menengai Agrovet - Bovine genetics Premier Dairy LTD/Lessos Farmers CS LTD - Milk marketing Aberdare MPCS/Development Partners LTD – Milk processing	3	N/a	Business sites: ABS/Menengai Agrovet – Nakuru Premier Dairy/Lessos FCS – Nandi Greenlands Dairy LTD – Uplands, Lari Division.	Match cost: Kshs 12,000	Projected Increase in annual business revenue/income = Kshs. 960,000
Educational tours	Visits to successful demonstration farms to learn about: Farm grown protein. Semi-zero-grazing systems Calf rearing Zero-grazing systems Breeding	1	70	Tour site: Nakuru. Tour party: Endarasha FCS LTD, Nyeri.	Match cost: Kshs 25,000	
Base line surveys	Collection of baseline data to enable assessment -of farmers' training needs and status of dairy operations.	2	N/a	Survey sites: Endarasha FCS LTD, Nyeri. Kinale FCS LTD, Kiambu.	Match cost: Kshs 22,000	

Activity	Topic/objective covered	No. of events	Total Attendance (farmers, etc.)	Remarks/other assumptions	Match costs from activities	Projected people level impacts
Farmers field days	Feed conservation; Forage establishment; Feed formulation; Breeding; Artificial insemination; Mineral supplementation; Dairy records; Appropriate acaricide use; Milk product marketing	5	476	Field day sites: Nyambogichi FCS, Jaribu CS, Kiriita DFCS, Olorongai FFS & Winyitie FCS.	Match cost: Kshs 27,550	Projected increase in annual household incomes: Kshs 379,428
Training of trainers	Tube silage Above-ground silage Economics of silage making	1	50	Venue: Wambugu FTC, Nyeri:	Match cost: Kshs 2,000	
International processing consultancy	HACCP awareness Processing Product development	1	N/a	Target beneficiaries: Meru Central Farmers Co-operative Union, Meru. Premier Dairy LTD Nyota Dairy LTD, Kitale.	Match cost: Kshs 9,000	
On-Farm technical consultancy	Forage establishment Dairy housing Breeding Farm layout	1	N/a	Consultancy site: Kinangop	Match cost: Kshs 1,280,000	Projected increase in annual household income: Kshs 732,000
Monitoring and Evaluation: Small-scale processing Management training Training of trainers	 Follow-up on adoption of small-scale processing techniques and business performance of trainees. Follow-up on business performance of co-operative beneficiaries of management training courses. Impact assessment on activities of trained trainers on silage making.		N/a	Monitoring & Evaluation sites: Small-scale processing – Nyahururu. Management Training – Kaptumo Multi-purpose Co-operative Society LTD, Nandi. Training of Trainers – Kiambu & Nyeri.	Match cost: Kshs 1,458,580	Increase in household income: Kshs 4,010,038
Total	♦ Co-operatives/farmers' groups that received training: 10 ♦ Membership: 25,340		663	Exchange rate: USD 1: Kshs. 75	**Total match cost: Kshs. 2,867,930 USD 38,239**	**Total Annual Increase in Household/ Business Income: Kshs. 6,081,466 USD 81,086**

Nb: Calculations for the people-level impacts and match costs and the assumptions made were presented in the four quarterly reports of the project.

IV. Uncompleted Tasks/Objectives

The Dairy Development for Kenya project was to spearhead policy dialogue through registration of a dairy industry stakeholders association (DISAK) and subsequent capacity building for the association. However, this was not completed because the Government of Kenya had not granted registration approval for this association by end of the project.

V. Lessons Learned and Challenges Faced

Lessons Learned

- Current strengths of the Kenya dairy industry include an improved dairy herd of an estimated 3 million cattle and 9 million head of Zebu cows. This population of animals produces 2.5 billion liters of milk, which is equivalent to approximately fourteen percent of the total value of agricultural production, or 23.1 billion shillings in 1995. Roughly 600,000 smallholder dairy farmers produce about eighty percent of this milk. Despite the collapse of the Kenya Cooperative Creameries (KCC) in 1992, it is estimated that more than ten new private-sector processors have been licensed by the Kenya Dairy Board and are in operation to compete in newly liberalized markets. In total, these processors have an installed capacity of over 2 million liters per day yet produce only an estimated 600,000 liters of processed milk daily.

- Issues of year-round productivity explain part of the problem of under-utilization in processing. This is because there is ample milk during the wet season, contrasting with shortages during drier seasons. These flush- and dry-season variations in production result in significant price fluctuations. This translates in producers at times not covering their production costs during seasons where supply exceeds demand because processors reduce prices and periodically introduce quotas to manage over-supply. Land O'Lakes tackles these issues through technical assistance to reduce the seasonality of feeds and is currently striving to alleviate the problem through feed conservation training. The methods of feed conservation emphasized are silage making (using plastic tubes, above ground, and in pits) and hay making. Training on fodder growing and establishment, particularly Napier grass, sorghum, maize, etc., is undertaken alongside that on feed conservation. Other components of the program focus are on technical assistance in the areas of animal health and breeding, primarily to increase on-farm productivity and reduce the costs of milk production through the use of high-grade genetics, sound business development principles and other production issues.

- As the Land O'Lakes field program addresses the technical dairy production issues amongst the smallholder farmers, it is important to also address the socio-economic issues such as gender and ownership and management of resources within the farm families. It is clear that these socio-economic issues also affect the dairy operations within the families.

- Visits by smallholder farmers to progressive smallholders have continued to be an effective training method because the host farmers speak from experience. The visiting farmers not only hear their hosts talk to them, but they also see appropriate technologies working.

- It is important to include members of the co-operatives or other farmer groups in the train-the-trainer program rather than only government staff. This is likely to be more sustainable because the trainees will always be with the targeted groups. While it is important to train the government staff, as their work in general is to train farmers, they may not always be in touch with the farmers. Their availability will always depend on government resources available for training activities.

- Working with other development organizations will not only facilitate sharing of information and therefore experiences, but can also result in supplementary budget inputs, which will enable Land O'Lakes to reach more clients.

- The move by Premier dairy to install a cooler in Kisumu, from which milk is dispensed to informal traders for resale, is a good indicator for the industry that the way forward is for the processors to work together with the informal sector.

Challenges Faced

- Lack of adequate transport was a challenging factor in implementation of KDD work and hindered execution of field work plans. This was due to government bureaucracy that obstructed acquisition of an extra vehicle.

- The high increase in the demand for our services within the industry, against a limited budget and staff capacity, was also a challenge.

APPENDIX A

Financial Report

[Financial report not included in DEC version]

APPENDIX B

USAID-Approved Work Plan

DAIRY DEVELOPMENT FOR KENYA

WORK PLAN

1. Workplan Development

In a workplan development meeting held on 30 January 2002 and chaired by Dr. Maria Mullei of USAID, a brainstorming session was conducted and a workplan (Page 5) was developed.

The meeting was held at the Land O'Lakes offices and the following were in attendance:

1. Dr. Maria Mullei – United States Agency for International Development (USAID)
2. Mr. Pharesh Ratego – USAID
3. Mr. Michael Kibinge – Land O'Lakes
4. Dr. Joseph Methu – Land O'Lakes, Inc.

The chart on the next page outlines the summary outputs expected to be achieved within the twelve-month project timeframe. As is evident from the chart, that the program will be implemented to thousands of dairy stakeholders directly and many others indirectly through the proposed field activities. The workplan is aimed at achieving people-level impacts.

Dairy Development proposal for Kenya: Project Logical framework

Goal/Objective	Activities	Outputs	Performance indicators	Assumptions
Private, commercially oriented dairy sector strengthened			5 % increase in milk marketed by the targeted co-operatives	A stable macro-economic & political environment prevails
	1. Provision of technical assistance to processors - Constraints analysis - Consultancy services to processors	Analysis report done and disseminated to processors	20 % of targeted processors report reduction in processing costs	
	2. Policy dialogue – facilitate DISAK registration		DISAK registered by end of project period	Improved partnership between GoK and NGOs
	3. Informal market analysis	Minimum standards acceptable to consumers & KDB	25 % of targeted hawkers practice minimum standards developed	GoK/KDB approves the minimum standards
	4. Association development of DISAK (capacity building, strategic planning)	Action plan	Implementation of action plan initiated by end of project	
	5. Development of co-operatives – Training in - Management - Feed conservation	At least 6 co-operatives with total membership of about 4500 trained	50 % of the coops implementing improved management & feed conservation practices	Issues of procurement with GoK resolved

Appendix II: Field Activity Chart, October 2001 – September 2002

Quarter 1 October – December 2001

	October				**November**				**December**			
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4
Masii	FD					MTC/GPM					BSF/BKP	
Kiriita					FD					MTCF/GPM	BSF/BKP	
Other Kiambu groups						MTC/GPM						
Jaribu	BSF/BKP							FD		MTCF/GPM		
Rurii Arimi				MTG/GPM	FD/BSF			FD				
Winyitie		BS								MTCF/GPM		
Nyambogichi		FD								MTCF/GPM		
Kagicha				MTG/GPM				FD				
Upendo group				MTG/GPM & PPW				FD				
Igwamiti			BS	PPW		MTC/GPM						
Kieni groups			FV			MTC/GPM			PPW			
Lessos						MTC/GPM	FD					
Kaptumo						MTC/GPM	FD					
Biut						MTC/GPM	PPW					
NYALA/Associations/BORAK			FD(Staff)			MTC/GPM						
S/Scale Milk Handlers		MHCF-Nyh						MHCF-Nyh				
Informal Milk Market			IMM									
Processing Project												

Red = ABS/HPI/LOL consortium Blue = USAID dairy dev. Black = USDA private sector … Pink = Funding not identified

Indicate:

PPW: for Participatory Planning workshop
GPM: for General Planning Meeting
BL: for a By-laws meeting
MHC: Milk Handling course
MHCF: Milk Handling Course follow-up.
FD : Field Day/Seminar:
-During Planting Season, Dairy Cattle Feeding Principles,
-Feeding Conservation, Calf Rearing,
-Basic Records, DRSK/KSB Registration,
-Animal Health/Disease Control,
-Genetics, etc.

BS: Baseline Data gathering.
BSF: for Baseline Follow-up - monitoring & evaluation
MTC: Management Training for Co-ops.
MTCF: Management Training Follow-up for Co-ops.
MTG: Management Training for Groups.
MTGF: Management Training Follow-up for Groups.
PPC: Processing Projects.
FV: First Visit.
IMM Informal milk market agents

Quarter 2. January – March 2002

	January				February				March			
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4
Masii			FD			BSF/BKP						
Kiriita							FD			BSF/BKP		
Other Kiambu groups	PPW								BS			
Jaribu				BSF/BKP								
Rurii Arimi							BSF/BKP	MTGF/ GPM			FD	
Winyitie			FD			BSF/BKP						
Nyambogichi			FD			BSF/BKP						
Kagicha							BSF/BKP	MTGF/ GPM				
Upendo group				BS				MTGF/ GPM				
Igwamiti							FD					
Kieni groups										BS		FD
Lessos		BS										FD
Kaptumo		BS										FD
Biut		BS										
NYALA/Associations			FD									
S/Scale Milk Handlers					MHC-Nku				MHC-Nrbi		MHC-Eld	
Informal Milk Market				IMM								IMM
Processing Projects		PCP										PCP

Quarter 3. April – June 2002

	April				May				June			
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4
Masii			BSF/BKP				FD			MTCF/ GPM	BSF/BKP	
Kiriita			BSF/BKP									
Other Kiambu groups							FD			MTCF/ GPM		
Jaribu				BSF/BKP								
Rurii Arimi						FD						
Winyitie		FD										
Nyambogichi		BSF/BKP										
Kagicha						FD					BSF/BKP	
Upendo group				FD							BSF/BKP	
Borak (Marmanet)												FD
Kieni groups	FD							FD				
Lessos					BSF/BKP					MTCF/ GPM		
Kaptumo					BSF/BKP					MTCF/ GPM		
Biut					BSF/BKP					MTCF/ GPM		
NYALA/Associations		FD								MTCF/ GPM		
S/Scale Milk Handlers								MHCF-Nku				
Informal Milk Market									IMMF			
Processing Project							PCP					
Newly identified co-ops/groups	PPW								MTC			

Quarter 4. July – September 2002

	July				August				September			
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4
Masii		FD				BSF/BKP						
Kiriita		FD				BSF/BKP						
Other Kiambu groups						BSF/BKP				FD		
Jaribu			FD									
Rurii Arimi	BSF/BKP									FD		
Winyitie	BSF/BKP		FD								FD	
Nyambogichi			FD									
Kagicha										FD		
Upendo group							FD				FD	
Borak (Marmanet)												
Kieni groups				BSF/BKP			FD					
Lessos					FD			BSF/BKP				
Kaptumo					FD			BSF/BKP				
Biut					FD			BSF/BKP				
NYALA/Associations							FD				FD	
S/Scale Milk Handling				MHC-Nbi				MHCF-Eld				
Informal Milk Market			IMMF									
Processing Project							PCP					PCP

APPENDIX C

SUCCESS - PICTORIAL ACCOUNTS

Mr. Edward Njuguna (pictured next to his Friesian cows below) farms ten acres of land and has 16 Friesian cows at Ol Rongai, Nakuru. Njuguna is one of the farmer beneficiaries of Land O'Lakes training services under Dairy Development for Kenya.

Included in the photo below are Land O'Lakes field staff during a field visit to his farm. Left: David Odong, Business Development Specialist; right: Josephine Kirui, Animal Production Specialist

Making silage in polythene tubes was a key training activity under the feed conservation component of the Dairy Development for Kenya project. Below is a farmer showing his success in making and conserving silage. Technical advice to smallholder farmers was provided by Land O'Lakes.

Training on clean milk production under KDD

A farmer training session under KDD

APPENDIX D

People-Level Impact

Dairy Development for Kenya – People-Level Impact

USAID Agreement 623-A-00-01-00102-00

Assumptions

1. Average forage yield per acre of sorghum planted = 10,000 kg (10 tons)
2. Average forage requirement by a cow = 25 kg per cow per day
3. Average milk yield per cow due to forage alone for a cow fed 25 kg of forage = 7 liters per day
4. Average dry season milk price per liter = Kshs.14

a) Projected impact from the field day at Ol Rongai Farmers Field School, Nakuru on 19 April, 2002

REMARKS/IMPACT	**MONETARY IMPACT OF FIELD ACTIVITY ON FARMERS/CLIENTS**
Topics: Importance of AI, Basic Dairy Records, Acaricide use, Tube Silage Making. Match Cost -Labor costs for FD preparation: harvesting @ Kshs. 300/day per worker, chopping @ Kshs. 300/day per worker, average labor requirement = 2 workers. -Total labor cost: 2 workers x (Day1: Harvesting: Kshs. 300 + Day2: Chopping & compacting:Kshs. 300) = Kshs. 1,200. -Transport expenses of farmers group from Bahati Division, Nakuru = Kshs. 1,000. -Transport expenses of student group from AHITI, Naivasha = Kshs. 1,000. -Total match cost = Kshs. 1,200 + Kshs. 1,000 + Kshs. 1,000 = Kshs. 3,200. (USD. 41.03) Impact (Material ensiled: Napier grass) Amount of material ensiled = 1tube = 300kg, Milk price = Kshs. 17 -Dry season milk yield to farmer from ensiled material = 300kg x 7liters/25kg = 84liters. -Additional milk income to host farmer on account of LOL demonstration = 84liters x Kshs. 17 = Kshs. 1,428. (USD. 18.31) • Eight (8) participating farmers arranging to adopt tube silage using Napier grass, maize & sorghum material. -Average acreage per farmer to be ensiled = 1/8 acre. -Total acreage to be ensiled on account of LOL demonstration = 8 farmers x 1/8 acre = 1 acre. -Tonnage yield of material per acre = 20,000kgs. -Total volume of ensiled material for adopting farmers = 1acre x 20,000kg = 20,000kg. -Additional milk yield to adopting farmers = 20,000kg x 7liters/25kg = 5,600liters. -Additional milk income to adopting farmers on account of LOL demonstration = 5,600liters x Kshs. 17 = Kshs. 95,200. -Total monetary impact = Kshs. 1,428 + Kshs. 95,200 = Kshs. 96, 628. (USD. 1,238.82)	MATCH COST KSHS. 3,200 (USD 41.03) MONETARY IMPACT KSHS. 96,628 (USD 1,238.82)

b) Projected impact of the Training of Trainers (TOT) activity in Kiambu assessed on 22 – 24 April 2002

REMARKS/IMPACT	MONETARY IMPACT OF FIELD ACTIVITY ON FARMERS/CLIENTS
M&E evaluation of the TOT on silage making carried out in Kiambu at Waruhiu FTC in November 2001. Key information to Match cost & Impact data calculations: - LOL is informed that trainers instructed farmers on making tubes of 300kg using 2metre polythene per tube. -For above-the-ground silage: 20metre 500guage-polythene sheets used per silo @ Kshs. 60/metre. -Tube polythene purchased by farmers – 1000 gauge @ Kshs. 110/metre. -Molasses purchased by farmers @ Kshs. 350 per 20 liter jerrycan. -Labor charges: harvesting @ Kshs. 300/day per worker; chopping @ Kshs. 300/day per worker; average labor requirement = 2 workers. - Average labor cost per farmer = 2 workers x (Day 1:Harvesting: Kshs. 300 + Day 2:Chopping & compacting: Kshs. 300) = Kshs. 1,200. Match Cost ▪ 11 rolls polythene purchased for resale to farmers by local retail outlet Githunguri Sweet & Polythene Shop, Githunguri @ Kshs. 110 per metre x 40metres/roll = Kshs. 48,400. ▪ Tube polythene 1,000 gauge purchased by 10 farmers assessed = 36tubes x 2metres/tube x Kshs. 110/metre = Kshs. 7,920. ▪ Sheet polythene 500 gauge purchased by 3 farmers = Kshs. 60/metre x 20metre per silo x 3 silos = Kshs. 3,600. ▪ Molasses purchased = 10 farmers x 20 liter jerrycan molasses @ Kshs. 350 = Kshs. 3,500. ▪ Labor expenses = 10 farmers x Kshs. 1,200 per farmer = Kshs. 12,000. ▪ 30,000 liter molasses storage facility availed by Githunguri FCS to members for molasses supply to support farmers' LOL-initiated silage-making activities: Procurement cost of molasses = Kshs. 17.50 per liter. Procurement cost of 30,000 liters molasses = 30, 000liters x Kshs. 17.50 = Kshs. 525,000. Total Match Cost = Kshs. 48,400 + Kshs. 7,920 + Kshs. 3,600 + Kshs. 3,500 + Kshs. 12,000 + Kshs. 525,000 = **Kshs. 600,420 ($US 7,697.69)** Impact *a. Visit to 10 tube-silage adopters.* *b. 18 training sessions held by LOL Trainees & 414 farmers trained on silage making.* *a. <u>Visit to 10 tube-silage adopters:</u>* i. Githua Mungai – 14 tubes made x 300kg/tube. To ensile further 1/8 acre of Napier. ii. Solomon Waweru – 5 tubes made x 300kg/tube. To ensile further ¼ acre of Napier.	

iii. Karanja Kangogo – 1 tube made x 300kg. iv. George Muriithi – 1 tube made x 300kg. v. Mrs. Mukura – (2 tubes made x 500kg) + (3 tubes x 300kg). vi. Njuguna Kihanya – 1 tube x 300kg. vii. Muigai Muhimu – 1 tube x 300kg. viii. John Njau Gitama – 1 tube x 300kg. ix. James Njoroge Mbogo – 7 tubes x 300kg. x. Evanson Wahimba – Above ground silage comprising 1acre maize. Total impact calculations from (a): -Amount of material ensiled on account of LOL intervention: i.[(14tubes x 300kg) + (1/8acre x 20, 000kg)] + ii.[(5tubes x 300kg) + (1/4 acre x 20, 000kg)] + iii.(1tube x 300kg) + iv.(1tube x 300kg) + v.[(2tubes x 500kg)+(3tubes x 300kg)] + vi.(1tube x 300kg) + vii.(1tube x 300kg) + viii.(1tube x 300kg) + ix.(7tubes x 300kg) + x.(1acre x 20, 000kg) = 4200kg + (1500kg+5000kg=6500kg) + 300kg + 300kg + (1000kg+900kg=1900kg) + 300kg + 300kg + 300kg + 2100kg + (1acre x 20000kg=20000kg) = <u>36,200kg.</u> -Dry season milk yield to silage-adopting farmers on account of LOL intervention: 36,200kg x 7liters/25kg = 10,136liters. <u>-</u>Additional milk income to silage-adopting farmers on account of LOL intervention: Milk price = Kshs. 20 per liter; 10,136 liters x Kshs. 20 = Kshs. 202,720. (USD. 2,598.97)	
b. Training by TOT beneficiaries: During 18 silage demonstrations, 18 tubes were made with average weight of 385kg each; Material ensiled was Napier grass. -Volume of material ensiled on account of LOL intervention = 18 tubes x 385kg = 6,930kg. -Additional dry season milk yield on account of LOL intervention = 6,930kg x 7liters/25kg = 1,940.4liters. -Additional dry season milk yield to host farmers on account of LOL intervention = 1,940.4 liters x Kshs. 20 = Kshs. 38,808. -Total monetary impact = Kshs. 202,720 + Kshs. 38,808 = Kshs. 241,528. (USD. 3,096.51)	MATCH COST KSHS. 600,420 (USD 7,697.69) Total Projected People-Level Impact KSHS. 241,528 (USD 3,096.51)

c) Impact on Kaptumo Multi-purpose Coop from Management Training and Animal Husbandry Training (M&E assessment on 8 – 9 May 2002)

REMARKS/IMPACT	MONETARY IMPACT OF FIELD ACTIVITY ON FARMERS/CLIENTS
Match Cost Consultancy fees at market rate for 2 days = Kshs. 5, 000 x 2 = Kshs. 10, 000; Total Match Cost = Kshs. 10, 000 Impact Impact from Management Course arising from improved business skills acquired at LOL course noted as follows: Improvement in business turnover for comparative period of January 2001 – April 2001 and January 2002 – April 2002. Jan2001 – April2001: Business turnover = Kshs. 620,716. Jan2002 – April2002: Business turnover = Kshs. 880,106. Variance: Kshs. 259,390. -Total monetary impact = Kshs. 259,390: Annual impact = 259,390 x 3 = Ksh. 778,170	MATCH COST KSHS. 10, 000. (USD 128) MONETARY IMPACT KSHS. 778,170 (USD 9,978)

d) Impact from Training of Trainers, Nyeri: 16 May 2002

40 attendants on 16.5.2002; Venue: Wambugu Farmers Training Centre, Nyeri. Topics:- Tube silage; Above-ground silage Match Cost Transport expenses incurred by course participants = Kshs. 2,000. Impact Impact from TOT activity will be assessed during routine field monitoring and evaluation.	MATCH COST: KSHS. 2,000 (USD 26)

e) Impact from International Processing Consultancy

20-25 May 2002: Benefiting processing plants: Meru Central Farmers Co-operative Union Dairy, Premier Dairy, Nyota Dairy -International consultancy services facilitated by LOL and rendered to selected processors. Match Cost Costs incurred by respective processors in hosting consultant and LOL team = Kshs. 9, 000. Impact Impact of international consultancy on processing operations of the selected factories will be assessed during routine field team monitoring and evaluation.	MATCH COST: KSHS. 9,000 (USD 115)

f) Match Costs During Farm Visits to Identify Possible Sites for Use as Demonstration Farms on 23 May 2002

REMARKS/IMPACT	MONETARY IMPACT OF FIELD ACTIVITY ON FARMERS/CLIENTS
Match Cost: Motor vehicle hire expenses = Kshs. 7,000; Consultancy fee at market rate = Kshs. 5,000; Procurement cost of pasteurizer & freezer by ex-participant at LOL small-scale processing course = Kshs. 400,000; Polythene tube material purchased by farmers = Kshs. 15,000. Total match cost = Kshs. 7,000 + Kshs. 5,000 + Kshs. 15,000 + Kshs. 400,000 = Kshs. 427, 000.	MATCH COST: KSHS. 427,000. (USD. 5,474)

g) Meeting between Premier Dairy LTD management, Lessos FCS management & LOL to discuss proposed installation of a milk cooler at Lessos FCS premises.

REMARKS/IMPACT	MONETARY IMPACT OF FIELD ACTIVITY ON FARMERS/CLIENTS
Meeting between Premier Dairy LTD management, Lessos FCS management & LOL to discuss proposed installation of a milk cooler at Lessos FCS premises. Match Cost: Transport expenses for 4 management committee members from Lessos to Eldoret = 4 x Kshs.500 = Kshs. 2,000. Transport expenses for management team from Premier Dairy LTD, Kericho to Eldoret = Kshs.5,000. Total match cost = Kshs. 2,000 + Kshs. 5,000 = Kshs. 7,000.	MATCH COST: KSHS. 7,000. (USD. 90)

h) Meeting between Aberdare Multi-purpose Co-operative Society LTD and LOL on 26 June 2002 at LOL offices

Agenda: Discussion on formation of Greenland Dairy LTD. This is a joint venture between a private investor and the co-operative society. Match Cost Transport expenses for 4 management committee members from Engineer, North Kinangop to Nairobi = Kshs. 5,000.	MATCHCOST: KSHS. 5,000. (USD. 64)

i) Small-Scale Processing & Milk Handling Course, Nyeri 25 – 26 June 2002

Training objective was to achieve at least 10% improvement in participants' business turnover, commencement of production of mala/yogurt and reduction in spoilage of milk handled. Match Cost Transport expenses incurred by participants = Kshs. 2,000. Participants contribution towards course expenses = Kshs. 17,000. Purchase of equipment by participants – Thermometers & lactometers = Kshs. 3,000 Fermentation cultures = Kshs. 5,000 Total match cost = Kshs. 2,000 + Kshs. 17,000 + Kshs. 3,000 + Kshs. 5,000 = Kshs. 27,000. Impact Monetary and other impacts will be assessed during field team's routine monitoring and evaluation of participants processing and business operations.	MATCH COST: KSHS. 27, 000. (USD. 346)

Total match cost: Ksh. 1,698,495 (US$ 21,766)

Total income impacts: Ksh. 597,546 (US $7,661)